DECISION

ENVIRONMENTAL ASSESSMENT: AQUATIC RODENT DAMAGE MANAGEMENT IN NORTH CAROLINA

PURPOSE AND NEED FOR ACTION

The United States Department of Agriculture (USDA), Animal and Plant Health Inspection Service (APHIS), Wildlife Services (WS) program has prepared an Environmental Assessment (EA) to analyze the potential impacts to the quality of the human environment from resolving damage and threats of damage associated with beaver (*Castor canadensis*), muskrats (*Ondatra zibethicus*), and nutria (*Myocastor coypus*)[1]. The EA and this Decision ensures WS complies with the National Environmental Policy Act (NEPA), with the Council on Environmental Quality guidelines (40 CFR 1500), and with the APHIS' NEPA implementing regulations (7 CFR 372). WS has previously developed an EA that analyzed the need for action to manage damage associated with aquatic rodents in the State (USDA 2012). Since activities conducted under the previous EA were re-evaluated under the new EA to address the new need for action and the associated affected environment, the previous EA that addressed managing damage caused by aquatic rodents will be superseded by the outcome of this Decision for the new EA.

The 1991 Session of the North Carolina Legislature created the North Carolina Beaver Damage Control Advisory Board to respond to public complaints and requests for assistance associated with beaver damage[2]. The Legislature required the Board to develop a program to manage beaver damage on public and private lands. As part of the program, the Board was to develop a priority system for responding to beaver damage complaints, develop a system for documenting activities, provide educational programs, provide for the hiring of personnel, evaluate the costs and benefits of the program, and advise the North Carolina Wildlife Resources Commission (NCWRC)[3] on its implementation. Based on the state legislature mandate, the Advisory Board created the Beaver Management Assistance Pilot Program in 1992 to assist property owners with managing damage associated with beaver in the State. After the successful implementation of a pilot program, the Advisory Board renamed the pilot program to the Beaver Management Assistance Program in 1995.

The need for action identified in Section 1.2 of the new EA arises from requests for assistance that WS receives as a member of the Beaver Management Assistance Program. In addition, WS also receives requests for assistance associated with damage or threats of damage caused by muskrats and nutria in the State. Beaver, muskrats, and nutria occur in similar aquatic habitats and many of the methods to reduce damage or threats of damage associated with those aquatic rodents are similar. The EA evaluates the need for action to manage damage associated with aquatic rodents, the potential issues associated with managing damage, and the environmental consequences of conducting different alternatives to meet the need for action while addressing the identified issues. WS defined the issues associated with meeting the need for action and identified preliminary alternatives through consultation with the NCWRC. The EA analyzes three alternatives in detail to meet the need for action and to address the issues analyzed in detail. Section 1.7 of the EA identified several decisions to be made based on the scope of the EA.

AFFECTED ENVIRONMENT AND ISSUES

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[1]The EA and this document will collectively refer to those mammal species as aquatic rodents.

[2]The Board is composed of members from the NCWRC, the North Carolina Department of Agriculture and Consumer Services, the North Carolina Forest Service, the North Carolina Division of Soil and Water Conservation, the North Carolina Cooperative Extension Service, the North Carolina Department of Transportation, the North Carolina Farm Bureau Federation, the North Carolina Forestry Association, and WS.

[3]The NCWRC has jurisdiction over the management of aquatic rodents and has specialized expertise in identifying and quantifying potential adverse effects to the human environment from damage management activities.

Aquatic rodent damage or threats of damage could occur statewide in North Carolina wherever those species occur. Beaver, nutria, and muskrats are semi-aquatic species that are capable of utilizing a variety of aquatic habitats in the State. Beaver, nutria, and muskrats occur throughout the year across the State where suitable aquatic habitat exists for foraging and shelter.

Issues are concerns regarding potential effects that might occur from a proposed activity. Federal agencies must consider such issues during the NEPA decision-making process. Section 2.2 of the EA describes the issues considered and evaluated in detail by WS as part of the decision-making process. In addition to those issues analyzed in detail, several issues were identified during the development of the EA but were not considered in detail. The rationale for the decision not to analyze those issues in detail is discussed in Section 2.3 of the EA. To identify additional issues and alternatives, the EA was also made available to the public for review and comment through notices published in local media and through direct notification of interested parties[4]. WS received five comment letters during the public comment period. Appendix A of this Decision summarizes the comments and provides responses.

ALTERNATIVES

The EA evaluated three alternatives in detail to respond to the issues identified in Chapter 2 of the EA. Section 3.2 of the EA provides a description of the alternatives evaluated in detail. A detailed discussion of the effects of the alternatives on the issues occurs in Chapter 4 of the EA. Additional alternatives were also considered but were not evaluated in detail with rationale provided in Section 3.2 of the EA. WS would incorporate those standard operating procedures discussed in Section 3.3 and Section 3.4 of the EA into activities if the decision-maker selected the proposed action alternative (Alternative 1) and when applicable, under the technical assistance alternative (Alternative 2), if selected. If the decision-maker selected the no involvement by WS alternative (Alternative 3), the lack of assistance by WS would preclude the employment or recommendation of those standard operating procedures addressed in the EA.

ENVIRONMENTAL CONSEQUENCES

Section 4.1 of the EA analyzes the environmental consequences of each alternative as that alternative related to the issues identified to provide information needed for making informed decisions in selecting the appropriate alternative to address the need for action. Section 4.1 of the EA analyzes the environmental consequences of each alternative in comparison to determine the extent of actual or potential impacts on those major issues identified in the EA. The proposed action/no action alternative (Alternative 1) served as the baseline for the analysis and the comparison of expected impacts among the alternatives.

The following resource values in North Carolina are not expected to be significantly impacted by any of the alternatives analyzed in the EA: soils, geology, minerals, water quality/quantity, flood plains, wetlands, critical habitats (areas listed in threatened and endangered (T&E) species recovery plans), visual resources, air quality, prime and unique farmlands, aquatic resources, timber, and range. The activities proposed in the alternatives would have a negligible effect on atmospheric conditions including the global climate. Meaningful direct or indirect emissions of greenhouse gases would not occur as a result of any of the alternatives. Those alternatives would meet the requirements of applicable laws, regulations, and Executive Orders, including the Clean Air Act and Executive Order 13514. Below is a

[4]The EA was made available to the public for review and comment by a legal notice published in *The News and Observer* newspaper on November 16, 2014. A notice of availability and the EA were also made available for public review and comment on the APHIS website beginning on November 7, 2014. WS also sent a notice of availability directly to agencies, organizations, and individuals with probable interest in managing aquatic rodents in the State. The public involvement process ended on December 19, 2014.

summary of the environmental consequences of the alternatives discussed in the EA for each of the issues analyzed in detail.

Issue 1 - Effects of Damage Management Activities on Target Aquatic Rodent Populations

Under the proposed action, WS would incorporate non-lethal and lethal methods described in Appendix B of the EA in an integrated approach in which all or a combination of methods could be employed to resolve a request for assistance. Non-lethal methods can disperse, exclude, or otherwise make an area unattractive to aquatic rodents that are causing damage; thereby, potentially reducing the presence of those animals at the site and potentially the immediate area around the site. Non-lethal methods generally have minimal impacts on overall populations of wildlife since those species are unharmed.

A common issue is whether damage management actions would adversely affect the populations of target aquatic rodent species when WS' employees employed lethal methods. Lethal methods can remove specific aquatic rodents that have been identified as causing damage or posing a threat to human safety. The number of aquatic rodents removed from a population by WS using lethal methods would be dependent on the number of requests for assistance received, the number of aquatic rodents involved with the associated damage or threat, the efficacy of methods employed, and the number of individual animals the NCWRC authorizes WS to remove, when required. Based on those quantitative and qualitative parameters addressed in the EA, the lethal removal of aquatic rodent species to alleviate damage or threats of damage under the proposed action alternative (Alternative 1) would be considered of low magnitude when compared to population trend data, population estimates, and/or harvest data.

Those people experiencing damage or threats could remove aquatic rodents themselves under any of the alternatives when the NCWRC authorizes the removal, when authorization is required. Therefore, other entities could remove those animals WS lethally removes annually to alleviate damage in the absence of involvement by WS. In some cases, a landowner or their designee can lethally remove individual animals of certain species at any time they cause damage without the need to have specific authorization from the NCWRC. In addition, a resource owner could seek assistance from private businesses to remove aquatic rodents causing damage or remove animals during the regulated hunting and/or trapping seasons in the State. Since the lack of WS' direct involvement does not preclude the lethal removal of aquatic rodents by those persons experiencing damage or threats, WS' involvement in the lethal removal of those aquatic rodents under the proposed action would not be additive to the number of aquatic rodents that could be removed by other entities in the absence of WS' involvement. The number of aquatic rodents lethally removed annually would likely be similar across the alternatives, since the removal of aquatic rodents could occur even if WS was not directly involved with providing assistance under Alternative 2 and Alternative 3. WS does not have the authority to regulate the number of aquatic rodents lethally removed annually by other entities.

Issue 2 - Effects on Non-target Wildlife Species Populations, Including T&E Species

Personnel from WS have experience with managing wildlife damage and receive training in the employment of methods. WS' employees would use the WS Decision Model to select the most appropriate methods to address damage caused by targeted animals and to exclude non-target species. To reduce the likelihood of capturing non-target wildlife, WS would employ the most selective methods for the target species, would employ the use of attractants that were as specific to target species as possible, and determine placement of methods to avoid exposure to non-targets. SOPs to prevent and reduce any potential adverse effects on non-targets were discussed in Chapter 3 of the EA. Despite the best efforts to minimize non-target exposure to methods during program activities, the potential for WS to disperse or lethally remove non-targets exists when applying both non-lethal and lethal methods to manage damage or reduce threats to safety.

The unintentional removal and capture of animals during damage management activities conducted under the proposed action alternative would primarily be associated with the use of body-gripping traps and in some situations, with live-capture methods, such as foothold traps, cage traps, and cable restraints. The non-targets lethally removed unintentionally by WS from FY 2009 through FY 2013 are representative of non-targets that WS' personnel could lethally remove under the proposed action alternative (see Section 4.1). WS could also lethally remove additional species of non-targets unintentionally. After further review of the EA and public comments, additional analyses relating to the unintentional removal of non-targets was included in the EA. The annual unintentional removal of river otters (*Lontra canadensis*), raccoons (*Procyon lotor*), and turtles exceeded two or three individuals annually from FY 2009 through FY 2013; therefore, further discussion on the unintentional removal of those species occurred in the EA (see Section 4.1). WS has evaluated the cumulative known lethal removal of river otters and raccoons, including target and non-target removal of those species by WS, in a separate analysis (USDA 2012) and is currently re-evaluating the cumulative known lethal removal of otter and raccoons in a new analysis (USDA 2015).

The unintentional removal of non-targets would likely be minimal with removal not exceeding one or two individuals of most species. Although WS' employees could lethally remove non-targets, removal of individuals from any species is not likely to increase substantially. WS would continue to monitor activities, including non-target removal, to ensure the annual removal of non-targets would not result in adverse effects to a species' population. Most of the non-targets that WS' employees lethally removed unintentionally from FY 2009 through FY 20103 are species that people can harvest during annual fishing, hunting, and/or trapping seasons. WS' limited unintentional removal of those species when compared to the harvest level of those species would be of low magnitude. WS' personnel have not captured or adversely affected any threatened or endangered species during previous activities conducted in North Carolina.

The ability of people to reduce damage and threats caused by aquatic rodents would be variable under Alternative 2 and Alternative 3, since the skills and abilities of the person implementing damage management actions or the availability of other entities capable of providing assistance could determine the level of success in resolving damage or the threat of damage. If people or other entities apply those methods available as intended, risks to non-targets would be similar to Alternative 1. If people or other entities apply methods available incorrectly or apply those methods without knowledge of wildlife behavior, risks to non-target wildlife would be higher under any of the alternatives. If frustration from the lack of available assistance under Alternative 2 and Alternative 3 caused those people experiencing aquatic rodent damage to use methods that were not legally available for use, risks to non-targets would be higher under those alternatives. People have resorted to the use of illegal methods to resolve wildlife damage that have resulted in the lethal removal of non-target wildlife.

Based on a review of those T&E species listed in the State during the development of the EA (see Appendix C in the EA), WS determined that activities conducted pursuant to the proposed action would not likely adversely affect those species listed in the State by the United States Fish and Wildlife Service (USFWS) and the National Marine Fisheries Services nor their critical habitats. Based on a review of the proposed action and the methods available under the proposed action, WS has determined that the proposed damage management program would not adversely affect any of the species listed by the NCWRC in the State. The USFWS and the NCWRC have concurred with WS' determination.

Issue 3 - Effects of Damage Management Methods on Human Health and Safety

The threats to human safety of methods available would be similar across the alternatives since the same methods would be available across the alternatives. However, the expertise of WS' employees in using

those methods available likely would reduce threats to human safety since WS' employees would be trained and knowledgeable in the use of those methods. If methods were used incorrectly or without regard for human safety, risks to human safety would increase under any of the alternatives that those methods could be employed. Although risks do occur from the use of those methods available, when people use those methods in consideration of human safety, the use of those methods would not pose additional risks beyond those associated with the use of other methods. No adverse effects to human safety occurred from WS' use of methods to alleviate aquatic rodent damage in the State from FY 2009 through FY 2013.

Issue 4 - Effects on the Aesthetic Values of Aquatic Rodents

Aquatic rodents may provide aesthetic enjoyment to some people in the State through observations, photographing, and knowing they exist as part of the natural environment. Methods available that could be employed under each of the alternatives would result in the dispersal, exclusion, or removal of individuals or small groups of aquatic rodents to resolve damage and threats. Therefore, the use of methods often results in the removal of aquatic rodents from the area where damage was occurring or the dispersal of aquatic rodents from an area. Since methods available would be similar across the alternatives, the use of those methods would have similar potential impacts on the aesthetics of aquatic rodents. However, even under the proposed action alternative, the dispersal and/or lethal removal of aquatic rodents under the alternatives would not reach a magnitude that would prevent the ability to view those species outside of the area where damage was occurring. The effects on the aesthetic values of aquatic rodents would therefore be similar across the alternatives and would be minimal.

Issue 5 - Humaneness and Animal Welfare Concerns of Methods

The issue of humaneness was also analyzed in detail in relationship to methods available under each of the alternatives. Since many methods addressed in Appendix B of the EA would be available under all the alternatives, the issue of method humaneness would be similar for those methods across all the alternatives. As stated previously, immobilizing drugs and euthanasia chemicals would be the only methods that would have limited availability to all entities under the alternatives. The ability of WS to provide direct operational assistance under the proposed action alternative would ensure methods were employed by WS as humanely as possible. Under the other alternatives, other entities could use methods inhumanely if used inappropriately or without consideration of aquatic rodent behavior. However, the skill and knowledge of the person implementing methods to resolve damage would determine the efficacy and humaneness of methods. A lack of understanding of the behavior of aquatic rodents or improperly identifying the damage caused by aquatic rodents along with inadequate knowledge and skill in using methodologies to resolve the damage or threat could lead to incidents with a greater probability of other people perceiving the action as inhumane under Alternative 2 and Alternative 3. Despite the lack of involvement by WS under Alternative 3 and WS' limited involvement under Alternative 2, those methods perceived as inhumane by certain individuals and groups would still be available to the public to use to resolve damage and threats caused by aquatic rodents.

Issue 6 - Effects of Damage Management Activities on the Regulated Harvest of Aquatic Rodents

People can harvest beaver and muskrats during regulated trapping seasons within the State. When causing damage to property, a landowner or their designee may lethally remove beaver at any time using lawful methods. In addition, there is no closed hunting season for nutria and no closed trapping season for nutria east of Interstate 77 in the State. In addition, when in the act of causing damage, a property owner can remove muskrats at any time using a firearm without the need for a permit from the NCWRC. Otherwise, a property owner can remove muskrats with a permit from the NCWRC or during the trapping season. The magnitude of lethal removal addressed in the proposed action (Alternative 1) would be low

when compared to the mortality of those aquatic rodent species from all known sources. Based on the limited removal proposed by WS and the oversight by the NCWRC, WS' removal annually would have no effect on the ability of those persons interested to harvest aquatic rodents during the regulated harvest season. WS would have no impact on the ability to harvest those species during the annual hunting and/or trapping seasons for those species under Alternative 2 and Alternative 3 since WS would not be directly involved with managing damage associated with those species. However, resource/property owners may remove aquatic rodents, resulting in impacts similar to the proposed action alternative under Alternative 2 and Alternative 3. The NCWRC could continue to regulate aquatic rodent populations through adjustments in allowed removal during the regulated harvest season and through permits to manage damage or threats of damage.

Issue 7 – Effects of Beaver Removal and Dam Manipulation on the Status of Wetlands in the State

If water remains impounded behind a beaver dam, hydric soils and hydrophytic vegetation may eventually form. This process can take anywhere from several months to years depending on pre-existing conditions. Hydric soils are those soils that are saturated, flooded, or ponded long enough during the growing season to develop anaerobic conditions. In general, hydric soils form much easier where wetlands have preexisted. Hydrophytic vegetation includes those plants that grow in water or on a substrate that is at least periodically deficient in oxygen because of excessive water content. If those conditions occur, then a wetland has developed that would have different wildlife habitat values than an area more recently impounded by beaver dam activity.

The intent of most dam removal or breaching is not to drain established wetlands. Requests from public and private individuals and entities that WS receives involve dam removal or breaching to return an area back to its pre-existing condition within months after beaver created the dam. If the area does not have hydric soils, it usually takes many years for them to develop and a wetland to become established. Upon receiving a request to remove/breach beaver dams, WS would visually inspect the dam and the associated water impoundment to determine if characteristics exist at the site that would meet the definition of a wetland under section 404 of the Clean Water Act. If wetland conditions were present at the site, WS' employees would notify the entities requesting assistance from WS that a permit might be required to remove/breach the dam. WS' employees would recommend the property owner or manager seek guidance from the North Carolina Division of Water Quality with the North Carolina Department of Environment and Natural Resources and the United States Army Corps of Engineers pursuant to North Carolina State Law and the Clean Water Act. Entities experiencing threats or damage due to flooding could manipulate water levels associated with beaver dams in the absence of WS' assistance. Those methods addressed in the EA would be available to other entities to breach or remove dams, including explosives and water flow devices.

CUMULATIVE IMPACTS OF THE PROPOSED ACTION

No significant cumulative environmental impacts are expected from any of the three alternatives, including the proposed action. Under the proposed action, the lethal removal of aquatic rodents by WS would not have significant impacts on statewide populations of those species when known sources of mortality are considered. No risk to public safety is expected when activities are provided under Alternative 1 and Alternative 2 since only trained and experienced personnel would conduct and/or recommend damage management activities. There is a slight increased risk to public safety when persons who reject assistance and recommendations and conduct their own activities under Alternative 2, and when no assistance is provided under Alternative 3. However, under all of the alternatives, those risks would not be to the point that the impacts would be significant. The analysis in this EA indicates that an integrated approach to managing damage and threats caused by aquatic rodents would not result in significant cumulative adverse effects on the quality of the human environment.

DECISION AND RATIONALE

I have carefully reviewed the EA prepared to meet the need for action. I find the proposed action alternative (Alternative 1) to be environmentally acceptable, addressing the issues and needs while balancing the environmental concerns of management agencies, landowners, advocacy groups, and the public. The analyses in the EA adequately addresses the identified issues, which reasonably confirm that no significant impact, individually or cumulatively, to wildlife populations or the quality of the human environment are likely to occur from the proposed action, nor does the proposed action constitute a major federal action. Therefore, the analysis in the EA does not warrant the completion of an Environmental Impact Statement.

Based on the analyses in the EA, the issues identified are best addressed by selecting Alternative 1 (proposed action/no action) and applying the associated standard operating procedures discussed in Chapter 3 of the EA. Alternative 1 successfully addresses (1) managing damage using a combination of the most effective methods and does not adversely impact the environment, property, human health and safety, target species, and/or non-target species, including T&E species; (2) it offers the greatest chance of maximizing effectiveness and benefits to resource owners and managers; (3) it presents the greatest chance of maximizing net benefits while minimizing adverse impacts to public health and safety; and (4) it offers a balanced approach to the issues of humaneness and aesthetics when all facets of those issues are considered. Further analysis would be triggered if changes occur that broaden the scope of damage management activities in the State, that affect the natural or human environment, or from the issuance of new environmental regulations. Therefore, it is my decision to implement the proposed action/no action alternative (Alternative 1) as described in the EA.

Based on the analyses provided in the EA, there are no indications that the proposed action (Alternative 1) would have a significant impact, individually or cumulatively, on the quality of the human environment. I agree with this conclusion and therefore, find that an Environmental Impact Statement should not be prepared. This determination is based on the following factors:

1. WS' activities to manage damage in the State would not be regional or national in scope.

2. Based on the analyses in the EA, the methods available under the proposed action would not adversely affect human safety based on their use patterns.

3. There are no unique characteristics such as park lands, prime farm lands, wetlands, wild and scenic areas, or ecologically critical areas that would be significantly affected. WS' standard operating procedures and adherence to applicable laws and regulations would further ensure that WS' activities do not harm the environment.

4. The effects on the quality of the human environment are not highly controversial. Although there is some opposition to managing damage and the methods, this action is not highly controversial in terms of size, nature, or effect.

5. Based on the analysis documented in the EA and the accompanying administrative file, the effects of the proposed damage management program on the human environment would not be significant. The effects of the proposed activities are not highly uncertain and do not involve unique or unknown risks.

6. The proposed action would not establish a precedent for any future action with significant effects.

7. No significant cumulative effects were identified through the assessment. The EA analyzed cumulative effects and concluded that such impacts were not significant for this or other anticipated actions to be implemented or planned within the State of North Carolina.

8. The proposed activities would not affect districts, sites, highways, structures, or objects listed in or eligible for listing in the National Register of Historic Places, nor would they likely cause any loss or destruction of significant scientific, cultural, or historical resources.

9. WS has determined that the proposed program would not adversely affect any federally listed T&E species currently listed in the State and the USFWS has concurred with WS' determination. In addition, WS has determined that the proposed activities would not adversely affect State-listed species.

10. The proposed action would be in compliance with all applicable federal, state, and local laws.

The rationale for this decision is based on several considerations. This decision takes into account public comments, social/political and economic concerns, public health and safety, and the best available science. The foremost considerations are that: 1) damage management would only be conducted by WS at the request of landowners/managers, 2) management actions would be consistent with applicable laws, regulations, policies and orders, and 3) no adverse effects to the environment were identified in the analysis. As a part of this Decision, the WS program in North Carolina would continue to provide effective and practical technical assistance and direct management techniques that reduces damage and threats of damage.

Charles S. Brown, Director-Eastern Region
USDA/APHIS/WS
Raleigh, North Carolina

3/23/15
Date

LITERATURE CITED

USDA. 2012. Environmental Assessment - Reducing mammal damage in the State of North Carolina. USDA-APHIS-WS, 6213 – E Angus Drive, Raleigh, North Carolina 27617.

USDA. 2015. Draft Environmental Assessment - Reducing mammal damage in the State of North Carolina. USDA-APHIS-WS, 6213 – E Angus Drive, Raleigh, North Carolina 27617.

APPENDIX A

RESPONSES TO COMMENTS ON THE ENVIRONMENTAL ASSESSMENT: AQUATIC RODENT DAMAGE MANAGEMENT IN NORTH CAROLINA

During the public involvement process for the EA, WS received five comment letters. WS has reviewed the comments to identify additional issues, alternatives, and/or concerns that were not addressed in the EA. The comments received during the public involvement process are summarized below along with responses to the comments.

Comment 1 – EA relies on outdated research and ignores the importance/benefits of beaver

The importance and benefits of beaver and beaver dams were discussed throughout the EA (*e.g.*, see discussions in Section 1.2, Section 2.2, and Section 4.1). The commenters claim to provide newer research on the benefits of beaver and beaver dams by citing a publication by Pollock et al. (2014), which discusses the use of beaver dams and "*beaver dam analogues*" (see Pollock et al. 2012) to accelerate the restoration of degraded stream habitat. Pollock et al. (2012) proposed using "*beaver dam analogues*"

[redacted]

Decision Model into agency decision-making when evaluating and responding to requests for assistance (see WS Directive 2.201).

The commenter claims the EA mistakenly uses the term "*exclusion*" device to include devices that control water levels in beaver ponds (*i.e.*, water control devices). However, the EA and Appendix B of the EA specifically discussions beaver exclusion devices and water control devices appropriately in the context of their use when managing damage associated with beaver. Appendix B specifically states, "*Beaver exclusion generally involves the placement of fencing to prevent beaver from accessing water intake areas, such as culverts*" and in a separate section states, "*Water control devices (e.g., pond levelers) are systems that allow the passage of water through a beaver dam.*" The commenter also states the EA fails to cite information on water control devices discussed by Taylor and Singleton (2014). However, Taylor and Singleton (2014) provide a review on the evolution of water control devices that people have developed over time to reduce flooding associated with beaver. The EA discusses a lot of the information summarized by Taylor and Singleton (2014). In general, the principals of beaver exclusion devices and water control devices are the same, many just vary by design. In addition, Taylor and Singleton (2014) state, "*Flow devices are not intended to replace lethal control; however, we recommend use of flow devices as part of integrated management plans where beaver flooding conflicts are expected and where local conditions allow flow-device installation and maintenance.*" The EA discusses the use of water control devices as part of an integrated methods approach to resolving damage associated with beaver.

Comment 4 – Support for damage management activities; support for continuing the proposed action alternative

WS appreciates the comments regarding the EA. Chapter 3 of the EA contains the discussion of the alternatives that were developed to meet the need for action discussed in Chapter 1 and to address the identified issues discussed in Chapter 2. Alternatives were developed for consideration based on the need for action and issues using the WS Decision model (Slate et al. 1992). The environmental consequences of the alternatives occurred in Chapter 4.

Comment 5 – Sources for the value of damages caused by beaver in Table 1.2 are not provided

As noted in Table 1.2, the economic losses for each resource listed in the table were derived from aquatic rodent damage reported to WS by a person requesting assistance or aquatic rodent damage that was verified by WS through a site visit based on a person requesting assistance. The information was compiled and reported by federal fiscal year in the table by resources based on requests for assistance received by WS. Therefore, the damage reported in Table 1.2 only reflects damage occurring on properties of people that request the assistance of WS and is not reflective of all damage that occurs in the State.

Comment 6 – WS attempts to discourage public involvement by grouping beaver with muskrat and nutria and calling them aquatic rodents

Section 1.1 of the EA clearly states that WS receives requests for assistance associated with beaver, muskrats, and nutria and the EA will collectively refer to those species as aquatic rodents. Taxonomically, beaver, muskrat, and nutria occur under the Order Rodentia. Mammal species occurring within this order are commonly referred to as rodents, which are characterized by a single pair of incisors that occur on the upper and lower jaws. Those incisors continuously grow requiring those species to keep the incisors short through gnawing; therefore, the damage or threats of damage (*e.g.*, gnawing, burrowing) they cause is similar. Beaver, muskrats, and nutria can also be found in similar aquatic habitats.

Section 1.2 of the EA describes the need for action associated with beaver, muskrats, and nutria and addresses the need for action associated with each species individually. The issues associated with meeting the need for action are similar and methods available to address damage or threats associated with beaver, muskrats, and nutria are similar. Therefore, referring to those three species as aquatic rodents is appropriate when collectively referring to all three species. As the commenter demonstrated in their comment, the EA presents information by species when the information in the EA is referring to a specific species. In those areas of the EA where the discussion applies to all three species together, beaver, muskrats, and nutria are collectively referred to as aquatic rodents as described in Section 1.1 of the EA. WS made no attempts to discourage public involvement by grouping beaver with muskrats and nutria in the EA.

Comment 7 – The Deems and Pursley (1978) citation regarding the current distribution of beaver is old

The EA states, "*Today, beaver occur throughout most of North America, including Canada, Alaska, all 48 contiguous states of the United States, and northern portions of Mexico (Deems and Pursley 1978).*" However, the discussion preceding the statement presented information that through overharvest and loss of habitat, beaver were nearly trapped to extinction by the late 1890s over much of their prior range. After the formation of federal, state, and provincial wildlife conservation agencies and the enactment of new regulations that controlled beaver harvest, beaver populations began to recover with many states releasing beaver in the 1920s through the 1950s to aid in recovery. The Deems and Pursley (1978) citation demonstrates that despite nearly being extinct in North America, the beaver population recovered due to conservation measures and the population had re-occupied a large portion of North America by 1978. The commenter did not present evidence in their comment that the information cited from Deems and Pursley (1978) was incorrect or has changed, only that the information was old.

Comment 8 – The EA ignores the role that vernal pools that beaver can create on the annual reproduction of the Caroline gopher frog (*Rana capito*) [sic]

The commenter referred to the "*Caroline gopher frog (Rana capito)*" [sic]; however, WS believes the commenter was referring to the gopher frog (*Lithobates capito*), which is currently under review by the USFWS as a threatened or endangered species in several southeastern states, including North Carolina. WS could not locate information on a "*Caroline*" gopher frog; however, there are references to a "*Carolina*" gopher frog (*Rana capito*) with some referring to the Carolina gopher frog as *Rana capito capito*. The NCWRC lists the Carolina gopher frog (*Rana capito capito*) as a threatened species in the State (NCWRC 2014). Based on recent taxonomic studies, many of the frogs in North America formerly in the *Rana* genus were placed into the genus *Lithobates* (Crother 2008, Crother 2012).

The commenter stated, "*Captio* [sic] *is entirely dependent upon small vernal pools, such as those created by beaver for its annual reproduction.*" However, vernal pools are ephemeral (*i.e.*, temporary pools of water), which generally dry up during certain portions of the year. Vernal pools are also generally small basins devoid of predatory fish. Beaver build dams to impound water and to maintain a certain water depth throughout the year. Therefore, the water impoundments that beaver create by building dams are, by their nature, not vernal pools because the area behind the dam does not dry up. In addition, the NCWRC has concurred with WS' determination that proposed activities would not adversely affect threatened or endangered species in North Carolina, including the gopher frog species found in North Carolina (see Section 4.1 of the EA).

Comment 9 – The statement in the EA that the associated problems of beaver exceed the benefits is unsupported

The commenter claims the statement in the EA that the associated problems of beaver can exceed the benefits is unsupported by prior discussions in the EA and is an editorial comment by the authors of the EA. However, the two sentences prior to the statement state, "*Opinions and attitudes of individuals, communities, and organizations vary greatly and are primarily influenced and formed by the positive and negative experiences of the person or entity expressing the judgment (Hill 1982). Property ownership, options for public and private land use, and effects on adjacent property impact public attitudes toward beaver (Hill 1982).*" In addition, the following two sentences further support the statement by stating, *Woodward et al. (1976) found that 24% of landowners who reported beaver activity on their property indicated benefits to having beaver ponds on their land. However, many landowners desire assistance with beaver pond management (Hill 1976, Woodward et al. 1985).*" The need for action (see Section 1.2 of the EA) is based on requests for assistance received by WS and the economic damages that can occur from aquatic rodents, including beaver. The EA also states, "*In some situations, the damage and threats caused by beaver outweigh the benefits (Grasse and Putnam 1955, Woodward et al. 1985, Novak 1987).*" The many benefits that beaver provide are discussed throughout the EA; however, in some cases, the damage that beaver can cause may outweigh the benefits. For example, removing a beaver dam built inside a culvert that is causing water to flood a major highway and saturate roadbeds may outweigh the benefits of the beaver dam.

Comment 10 – The EA contradicts itself by stating disease transmission occurs rarely but later states that beaver must be controlled to prevent transmission of disease

The commenter states, "*WS contradicts itself by stating...that beaver must be controlled to prevent transmission of disease*." WS was unable to locate any discussion in the EA that beaver "*must be controlled*" to prevent disease transmission. The EA briefly addresses some of the more commonly known diseases associated with aquatic rodents that are transmissible to people, including beaver (see Section 1.2 of the EA). The EA states that disease transmission from aquatic rodents to people is uncommon. In addition, the EA states that WS could receive requests for assistance with disease surveillance and monitoring but disease sampling would likely occur ancillary to other wildlife damage management activities (*i.e.*, would occur after aquatic rodents were captured or lethally removed for other purposes). WS actively attempts to educate the public about the risks associated with disease transmission from wildlife to people through technical assistance and by providing technical leaflets on the risks of exposure.

Comment 11 – Commenter could not locate a copy of the Woodward (1983) article and questioned whether the article existed and whether D. K. Woodward exists

The article by Woodward (1983) does exist. As shown in Appendix A of the EA, the citation for Woodward (1983) is:

Woodward, D. K. 1983. Beaver management in the southeastern United States: A review and update. Proceedings of the Eastern Wildlife Damage Control Conference 1:163-165.

Comment 12 – Commenter questioned whether aircraft have actually struck beaver

As stated in the EA, civil aircraft have struck at least 2 beaver and 20 muskrats at airports in the United States between 1990 and 2012 (Dolbeer et al. 2013). More recent data shows civil aircraft in the United States have struck at least 2 beaver and 25 muskrats between 1990 and 2013 (Dolbeer et al. 2014).

Although aircraft strikes involving aquatic rodents occur rarely, aircraft can and do strike aquatic rodents at air facilities. Those strikes can cause damage to aircraft, which can threaten the safety of passengers.

Comment 13 – EA incorrectly identifies historic structures as natural resources

The EA states, "*Examples of natural resources in North Carolina are historic structures and places, parks and recreational areas, natural areas, including unique habitats or topographic features, threatened or endangered plants and animals, and any plant or animal populations that the public has identified as a natural resource*". WS disagrees that historic structures cannot be natural resources because natural structures may have historic value or be important to the history of an area, such as a cave system. In addition, many historic sites are managed not only for their historic value but their value as natural areas. Even if historic structures were not considered natural resources, those structures would be considered property and the need to resolve property damage associated with aquatic rodents occurred in Section 1.2 of the EA.

Comment 14 – EA incorrectly claims that beaver increase sedimentation; however, beaver actually decrease sedimentation

The commenter stated, "*WS incorrectly asserts that beaver increase sedimentation, when in fact beaver decrease sediment loading*"; however, the commenter later in their comments states their opinion that "*it is well known that beaver dams accumulate and retain sediment*". As the commenter demonstrates, sedimentation generally increases upstream of the beaver dam as sediments settle out of the water because the water movement slows behind the beaver dam but sedimentation, in general, is lowered downstream of the beaver dam because the sediments that would be transported downstream in the absence of a beaver dam are trapped and accumulate behind the beaver dam. The EA states, "*Beaver dams obstruct the normal flow of water, which can...accumulate bottom sediment over time. The depth of the bottom sediment depends on the length of time water covers an area and the amount of suspended sediment in the water.*" The EA also states, "*...beaver ponds can...serve as basins for the entrapment of streambed silt and eroding soil.*" Therefore, the EA accurately reflects that sedimentation can increase upstream of a beaver dam just as the commenter states in their comment.

Comment 15 - The exemptions of Section 404 of the Clean Water Act addressed in 33 CFR 323 and 33 CFR 330 do not specifically address removing beaver dams

As stated in Section 1.6 of the EA, the discharge of dredged or fill material into the waters of the United States is prohibited without a permit unless the activity is exempted in 33 CFR 323 or covered by a nationwide permit in 33 CFR 330. Therefore, 33 CFR 323 provides guidance to determine whether certain activities require permits under Section 404 of the Clean Water Act, while 33 CFR 330 provides details regarding the Nationwide Permit Program, which allows certain dredge and fill activities on a nationwide basis if they have minimal impact on the environment. Appendix E of the EA discusses the specific exemptions (pursuant to 33 CFR 330) and Nationwide Permits (pursuant to 33 CFR 33) that may apply to removing beaver dams.

Comment 16 – Statements that beaver can interfere with threatened and endangered species requires verification

The commenter did not provide information on what specific statements in the EA need verification. However, as stated throughout the EA, WS would only provide assistance when requested by the appropriate landowner or manager. In the case of threatened or endangered species, the appropriate managing agency would likely be the entity requesting assistance, such as the United States Fish and Wildlife Service or the NCWRC based on information they have gathered or based on observations. In

those cases, those agencies would be responsible for verifying the damage or the threat of damage occurring to threatened or endangered species.

Comment 17 – The North Carolina Farm Bureau should not be a member of the advisory board for the Beaver Management Assistance Program

Chapter 13, Article 22, General Statute 113-291.10 of the North Carolina General Statutes established the Beaver Damage Control Advisory Board. The statute states, "*There is established the Beaver Damage Control Advisory Board. The Board shall consist of nine members, as follows...The President of the North Carolina Farm Bureau Federation, Inc., or a designee, representing private landowners...*"; therefore, the legislative body of North Carolina determined who should be present on the Advisory Board. The members of the Advisory Board are outside the scope of WS' authority.

Comment 18 – EA incorrectly states the beaver dam breaching and removal by hand does not affect the substrate or the natural course of the streams

The EA states, "*WS would generally breach or remove beaver dams by hand with a rake or power tools (e.g., a winch). WS would normally breach or remove dams through incremental stages of debris removal from the dam that allows water levels to be gradually lowered. Breaching of dams would normally occur to limit the potential for flooding downstream by gradually allowing water levels to lower as more of the dam was breached over time. Depending on the size of the impoundment, water levels could be slowly lowered over several hours or days when breaching dams. When breaching dams, only that portion of the dam blocking the stream or ditch channel would be altered or breached, with the intent of returning water levels and flow rates to historical levels or to a level that eliminates damage threats that would be acceptable to the property owner or resource manager.*" In addition, the EA states, "*Breaching also minimizes the release of debris and sediment downstream by allowing water to move slowly over or through the dam.*" As the EA states, only that portion of the beaver dam blocking the stream or ditch channel would be altered or breached. Once WS breached or removed a beaver dam, water would flow or circulate similar to how the water flowed or circulated prior to beaver constructing the dam. WS would not employ methods that would alter the course of streams.

Comment 19 – WS' employees should be trained to identify or delineate wetlands; the EA should not imply that beaver dams less than five years old do not contain wetland habitat

As was stated in the EA, a wetland has been defined as "*...those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions*" under 40 CFR 232.2. As the definition states, wetlands are recognized by three characteristics: hydric soils, hydrophytic vegetation, and general hydrology. WS' personnel would survey the beaver dam site, including the water impoundment, and determine whether conditions exist suggesting that the area may meet the definition of a wetland, including the age of the water impoundment. Therefore, the age of the water impoundment would not be the only factor that a WS' employee would consider when surveying beaver impoundment.

Comment 20 – WS should not rely on a landowner to accurately determine whether wetland conditions exists when removing a beaver dam

As stated in the EA, "*Upon receiving a request to manipulate the water levels in impoundments caused by beaver dams, WS would visually inspect the dam and the associated water impoundment to determine if characteristics exist at the site that would meet the definition of a wetland under section 404 of the CWA (40 CFR 232.2).*" Input from the landowner on the age of a water impoundment would not be the only

deciding factor in determining if a water impoundment created by a beaver dam met the definition of a wetland.

The intent of most dam breaching is not to drain established wetlands. With few exceptions, requests from public and private individuals and entities that WS receives involve dam breaching to return an area back to its pre-existing condition within a few years after the dam was created. If the area does not have hydric soils, it usually takes many years for them to develop and a wetland to become established. This often takes greater than five years as recognized by the Swampbuster provisions.

Comment 22 – Beaver dams are not discrete events as defined by the Nationwide Permit 3 issued by the United States Corps of Engineers

The commenter claims a beaver dam is not a discrete event as defined by the Nationwide Permit 3 because beaver dams can be built over a period of time. However, WS disagrees based on the wording in the permit. The Nationwide Permit 3 "*...authorizes the repair, rehabilitation, or replacement of those structures or fills destroyed or damaged by storms, floods, fire or other discrete events provided the repair, rehabilitation, or replacement is commenced, or is under contract to commence, within two years of the date of their destruction or damage*." The term "*event*" implies activities that occur during a particular interval of time or the outcome of activities. In addition, the language says "*storms, floods, fire or **other** discrete events*" [emphasis added]. Therefore, the use of the term "*other*" in the phrase "*other discrete events*" implies the language of the permit considers storms, floods, and fires are also "*discrete events*". Storms, floods, and fires can occur over an interval of time; therefore, the damage they cause may also occur over a period of time. The language also reads "*...within two years of the date of their destruction or damage*". The language does not state within two years of the date of when a storm, a flood, or a fire caused damage or destroyed the structure. The language also use the plural forms of storms, floods, fire, and other discrete events, which implies the damage or destruction may occur over multiple storms, floods, fire, of other discrete events.

Comment 23 – The Water Quality Certifications issued by the North Carolina Division of Water Resources do not include removal of beaver dams

The North Carolina Division of Water Resources is responsible for reviewing Water Quality Certifications applications required by Section 401 of the Clean Water Act (see Title 15A, Chapter 2, Subchapter H, Section .0501 of the North Carolina Administrative Code). In general, if a permit is not required pursuant to Section 404 of the Clean Water Act, a Section 401 permit is not required by the State. Similar to the Section 404 permits, the North Carolina Division of Water Resources has issued general Water Quality Certifications for those activities that are similar in nature and have been determined to have minimal impact on water quality. As stated in Section 1.6 of the EA, the discharge of dredged or fill material into the waters of the United States is prohibited without a permit unless the activity is exempted in 33 CFR 323 or covered by a nationwide permit in 33 CFR 330. Therefore, 33 CFR 323 provides guidance to determine whether certain activities require permits under Section 404 of the Clean Water Act, while 33 CFR 330 provides details regarding the Nationwide Permit Program, which allows certain dredge and fill activities on a nationwide basis if they have minimal impact on the environment. Appendix E of the EA discusses the specific exemptions (pursuant to 33 CFR 330) and Nationwide Permits (pursuant to 33 CFR 33) that may apply to removing beaver dams.

Comment 24 – The EA violates Executive Order 11988 by promoting development in floodplains

The development that does or does not occur within floodplains is outside the authority of WS.

Comment 25 – The use of legally approved methods does not exempt WS ensuring that children will not be harmed by WS' actions

The EA does not state or imply that using legal methods exempts WS from protecting human health and safety. The effect of methods on human safety, including children, was an issue analyzed in detail within the EA (see Section 2.2, Section 3.4, Section 4.1, and Section 4.2). The EA states, "*WS' employees could use and would recommend only those methods that were legally available under each of the alternatives. Still, some concerns exist regarding the safety of methods available despite their legality and selectivity.*" As stated in Chapter 4 of the EA, no adverse effects to human safety have occurred from WS' use of methods to alleviate aquatic rodent damage in the State from FY 2009 through FY 2013. The risks to human safety from the use of the non-lethal and lethal methods available, when used appropriately and by trained personnel, would be considered low.

Comment 26 – WS should prepare an Environmental Impact Statement

This issue was addressed in Chapter 2 of the EA. The underlying intent for preparing an EA is to determine if a proposed action might have a significant impact on the human environment. The EA development process is issue driven, meaning issues that were raised during the interdisciplinary process and through public involvement that were substantive, were used to drive the analysis and determine the significance of the environmental impacts of the proposed action and the alternatives. Therefore, the level of site specificity must be appropriate to the issues listed.

The analysis in the EA was driven by the issues raised during the scoping process during the development of the EA. In addition to the analysis contained in the EA, WS' personnel use the WS Decision Model described in Chapter 3 of the EA as a site specific tool to develop the most appropriate strategy at each location (see WS Directive 2.201). The WS Decision Model is an analytical thought process used by WS' personnel for evaluating and responding to wildlife damage management requests. If a determination were made through the EA that the alternatives developed to meet the need for action could result in a significant impact on the quality of the human environment, then an Environmental Impact Statement would be prepared.

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